United States
Department of
Agriculture

Soil
Conservation
Service

Bozeman,
Montana

Montana
Water Supply Outlook

January 1, 1987

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 97102
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97208
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Montana
Water Supply Outlook

and

Federal – State – Private
Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Glen H. Loomis
State Conservationist
Soil Conservation Service
Bozeman, Montana

Prepared by

Phillip E. Farnes
Snow Survey Supervisor
Soil Conservation Service
10 E. Babcock
Bozeman, Montana 59715

Table of Contents

State Streamflow Map 3

State General Outlook 4

Basin Outlook and Conditions

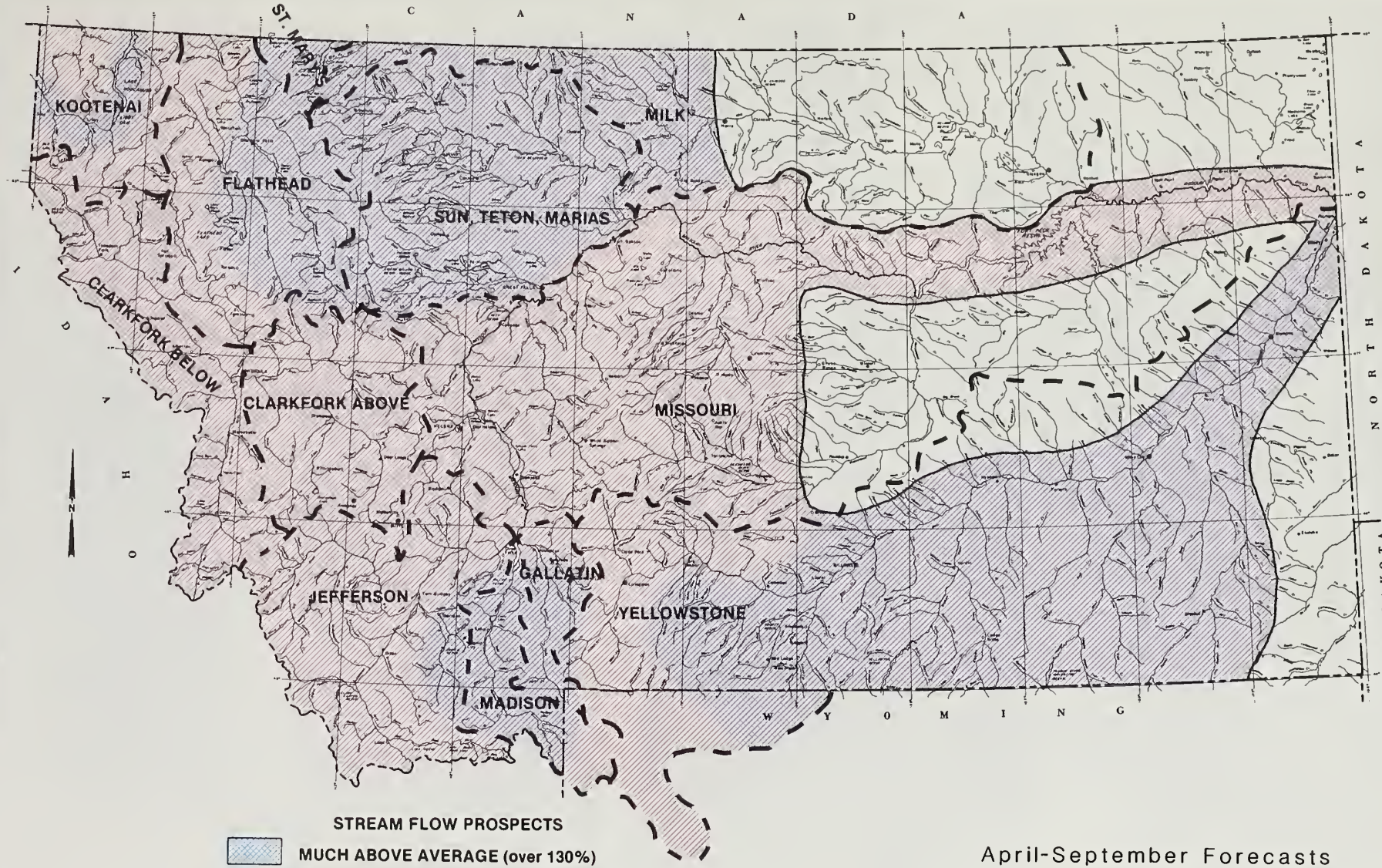
- Kootenai Basin 6
- Flathead Basin 8
- Clark Fork Basin above Missoula 10
- Clark Fork Basin below Missoula 12
- Jefferson Basin 14
- Madison Basin 16
- Gallatin Basin 18
- Missouri Basin 20
- Sun, Teton and Marias Basins 22
- St. Mary and Milk Basins 24
- Yellowstone Basin 26

Snow Data Measurements 28

Additional Information 30

U.S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



STREAMFLOW PROSPECTS FOR MONTANA

Spring and Summer Period

April-September Forecasts

January 1,1987

SOURCE:
Information provided by SCS Snow Survey Personnel.

JUNE 1985 4-R-39296

USDA SCS FORT WORTH TEXAS 1985

GENERAL OUTLOOK

SUMMARY:

Mountain snowpacks are below average over most of Montana. Many watersheds only have one-half of the snowpack usually expected at this time of the year. Only two areas have near average snowpacks. Precipitation in the last 4 months has been a collection of extremes rather than any specific pattern. A wetter than normal September was followed by a dry October. November was wet and December was very dry. Below average runoff is expected over most of the state this spring and summer. Reservoir storage is generally near or above average.

SNOWPACK:

January 1 snowpack levels are below average over most of the state. The only areas showing near average amounts are along the Continental Divide from Canada to the headwaters of the Sun River and the northeast face of the Beartooth Range west of Red Lodge. Well below average snowpacks cover small mountain ranges in central and north central Montana, the southern part of the Bitterroot drainage and the southern part of the Red Rock, Madison, and Yellowstone River headwaters.

PRECIPITATION:

December precipitation was well below average in all mountainous areas. The Kootenai and Flathead drainages had December amounts in the 35 to 45 percent of average range while other drainages had only around 20 percent of average amounts. November was a good precipitation month with above to well above average amounts in all areas except the southwest corner where amounts were a little below average. In October, mountain precipitation was below average over most of the state with only the northwest corner showing near average amounts.

RESERVOIRS:

Most irrigation and multipurpose reservoirs have near to above average storage for this time of year. Many reservoirs were drawn down for irrigation last fall, but good September rains improved soil moisture conditions and increased fall streamflows. Some of this runoff was stored prior to cold weather.

STREAMFLOW:

Below average runoff is forecast for most of the state this spring and summer. However, near to a little below average streamflows are expected on the Flathead, St. Mary, Sun, Marias, Teton, Madison, Gallatin, Boulder, Stillwater, and Clark's Fork Rivers. These forecasts are based on current snowpack levels and average precipitation for the remainder of the runoff period. Since less than one-half of the snow accumulation season has passed, these forecasts may change significantly over the next 2 to 3 months as more of the snowpack accumulates.

SOIL MOISTURE:

Heavy fall rains replenished soil moisture in most mountain soils. Along the northern drainages, rainfall was quite heavy and excess moisture produced above average runoff. Some surface drying occurred in October but only a small amount of snowmelt water will be needed to satisfy the soil moisture deficit before spring runoff begins.

NEW AVERAGE PERIOD:

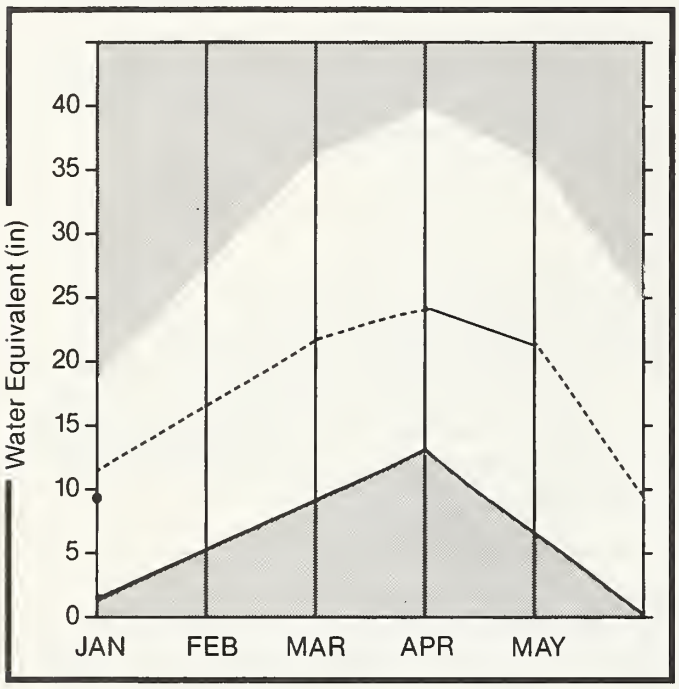
A base period from 1961-1985 will be used for all climatological and hydrological comparisons for the next 5 years. Copies of these 25-year averages are available on the Centralized Forecast System data base at the SCS computer facility in Portland, Oregon, or from the SCS Snow Survey Office in Bozeman.

ANNUAL DATA SUMMARY:

The summary of 1986 water year snow and precipitation data scheduled for release in December has been delayed. Release of this publication is now expected in February. In addition to data obtained in 1986, averages will be published for the new 1961-1985 base period.

Kootenai Basin

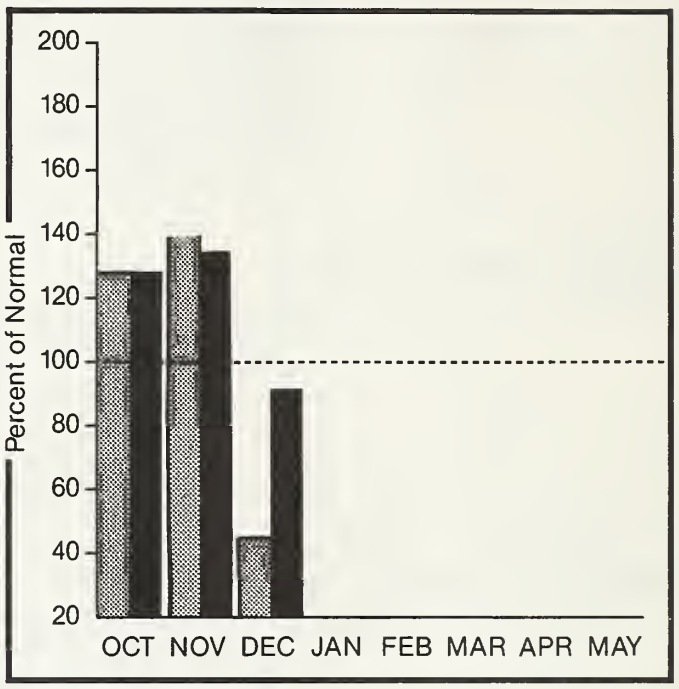
Mountain snowpack* (inches)



*Kootenai in Montana

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation was heavy in November but dropped off to less than half of average in December. This combination has resulted in a seasonal accumulation of precipitation a little below average and a current snowpack of about 88 percent of average. Streamflows from Montana tributaries are forecast to be below average while the main stem of the Kootenai is forecast to be near average.

For more information contact your local Soil Conservation Service office.

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
KOOTENAI RIVER blw Libby Dam 2	APR-JUL	6020.0	5630.0	94	1806.0	30	3824.0	64
	APR-SEP	7041.0	6690.0	95	8802.0	125	4578.0	65
FISHER RIVER near Libby	APR-JUL	248.0	200.0	81	275.0	111	126.0	51
	APR-SEP	264.0	210.0	80	289.0	109	131.0	50
YAAK RIVER near Troy	APR-JUL	500.0	415.0	83	565.0	113	265.0	53
	APR-SEP	523.0	440.0	84	597.0	114	283.0	54
KOOTENAI RIVER at Leonia 2	APR-JUL	7498.0	7080.0	94	9404.0	125	4756.0	63
	APR-SEP	8602.0	8170.0	95	10837.0	126	5503.0	64
	APR-JUN	6051.0	5750.0	95	7626.0	126	3874.0	64

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
LAKE KOOCANUSA	5748.0	3035.0	2971.0	3157.0

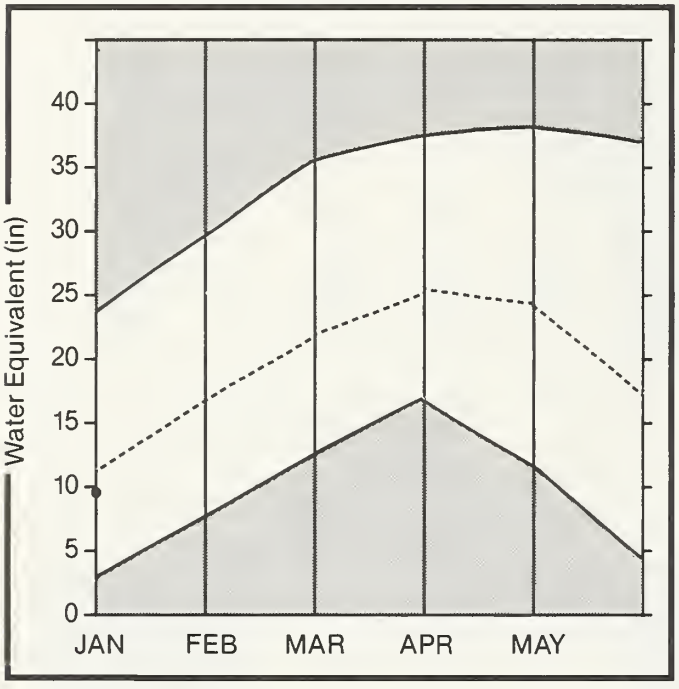
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
EAST KOOTENAI in B.C.	6	119	82
KOOTENAI in MONTANA	9	144	88
KOOTENAI ab BONNERS FERRY	14	124	85

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Flathead Basin

Mountain snowpack* (inches)



*Flathead

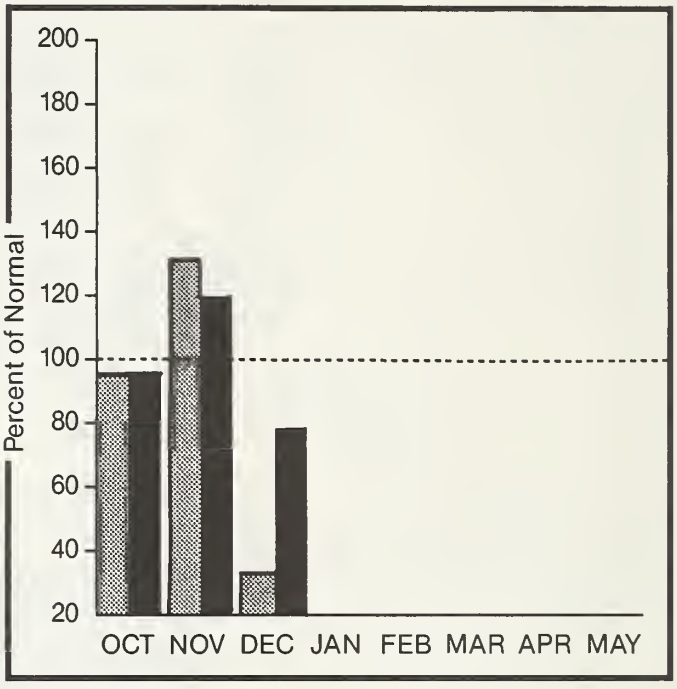
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Heavy November precipitation was followed by a dry December. Mountain precipitation was only about one-third of average during this past month. The current snowpack is much below average in the Salish Mountains, west of Kalispell, increasing to near average along the Continental Divide. Streamflow for spring and summer months is forecast to be a little below average.

For more information contact your local Soil Conservation Service office.

FLATHEAD RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
NF FLATHEAD near Columbia Falls	APR-JUL	1732.0	1540.0	89	2129.0	123	916.0	53
	APR-SEP	1913.0	1700.0	89	2389.0	125	1011.0	53
	APR-JUN	1471.0	1290.0	88	1820.0	124	760.0	52
MF FLATHEAD near West Glacier	APR-JUL	1713.0	1660.0	97	2428.0	142	923.0	54
	APR-SEP	1869.0	1810.0	97	2614.0	140	1006.0	54
	APR-JUN	1453.0	1420.0	98	2045.0	141	795.0	55
SF FLATHEAD near Columbia Falls 1	APR-JUL	2142.0	1960.0	92	2828.0	132	1189.0	56
	APR-SEP	2278.0	2080.0	91	2900.0	127	1260.0	55
	APR-JUN	1886.0	1700.0	90	2379.0	126	1021.0	54
FLATHEAD at Columbia Falls 1	ARP-JUL	5721.0	5310.0	93	7427.0	130	3193.0	56
	APR-SEP	6208.0	5740.0	92	8037.0	129	3443.0	55
	APR-JUN	4921.0	4620.0	94	6441.0	131	2799.0	57
SWAN RIVER near Big Fork	APR-JUL	604.0	545.0	90	666.0	110	424.0	70
	APR-SEP	689.0	615.0	89	753.0	109	477.0	69
FLATHEAD RIVER near Polson 2	APR-JUL	6712.0	6240.0	93	7582.0	113	4898.0	73
	APR-SEP	7278.0	6740.0	93	8196.0	113	5284.0	73
	APR-JUN	5759.0	5340.0	93	6492.0	113	4188.0	73

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CAMAS (4)	45.2	21.2	18.3	19.3
MISSION VALLEY (8)	100.0	29.7	37.6	34.1
HUNGRY HORSE	3451.0	2613.0	2562.0	2649.0
FLATHEAD LAKE	1791.0	1099.0	1354.0	1340.0

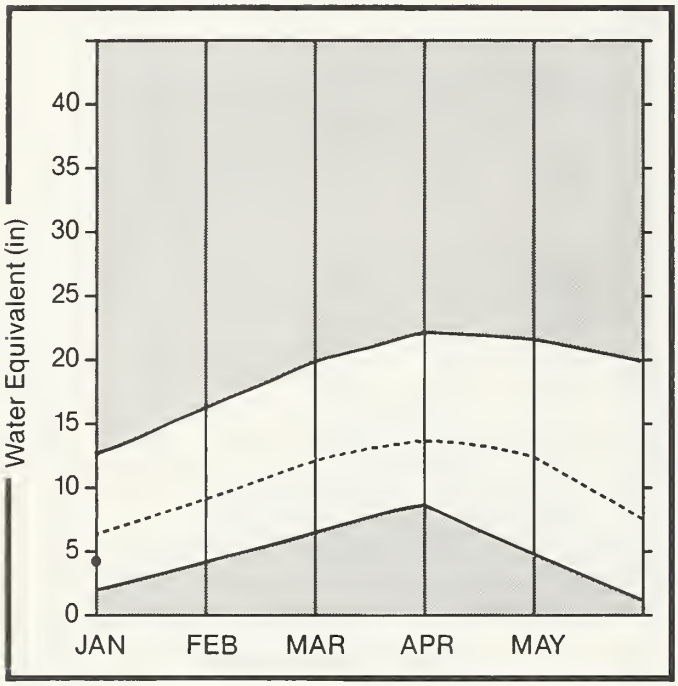
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
NORTH FORK FLATHEAD	4	131	92
MIDDLE FORK FLATHEAD	10	112	95
SOUTH FORK FLATHEAD	11	89	77
STILLWATER-WHITEFISH	3	86	63
SWAN	8	95	79
LITTLE BITTERROOT	2	83	58
FLATHEAD	26	105	86

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Clark Fork Basin above Missoula

Mountain snowpack* (inches)



*Clark Fork above Missoula

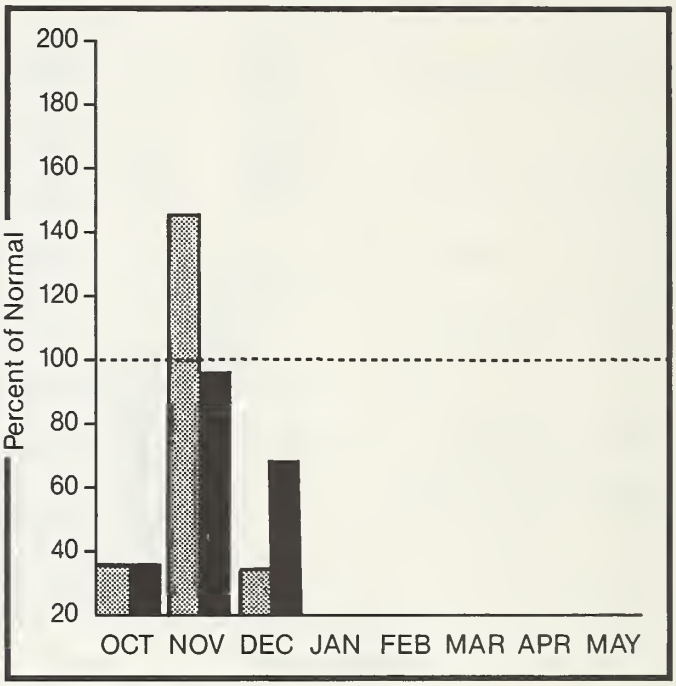
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

The mountain snowpack is presently about 25 percent of average. Precipitation was generally near or a little above average earlier in the season but has been only about one-third of average in December. Spring and summer streamflows are forecast to be below average.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MOULTON RESERVOIR Inflow (MG)2	APR-JUL	263.0	210.0	80	287.0	109	131.0	50
	APR-JUN	237.0	190.0	80	262.0	111	119.0	50
WARM SPRINGS CR at Meyers Dam 2	APR-JUL	37.8	30.0	79	41.0	108	19.0	50
	APR-SEP	46.8	37.0	79	51.0	109	23.0	49
FLINT CREEK near Southern Cross 2	APR-JUL	15.4	11.9	77	18.0	117	6.0	39
	APR-SEP	18.3	13.9	76	21.0	115	7.0	38
FLINT CREEK below Boulder Creek 2	APR-JUL	59.9	48.0	80	72.0	120	24.0	40
	APR-SEP	75.8	62.0	82	92.0	121	32.0	42
LOWER WILLOW CR RES Inflow 2	APR-JUL	14.9	12.0	81	18.0	121	6.0	40
	APR-SEP	15.7	13.3	85	20.0	127	7.0	45
M. FK. ROCK CRK near Philipsburg	APR-JUL	70.5	56.0	79	77.0	109	35.0	50
	APR-SEP	78.2	62.0	79	85.0	109	39.0	50
NEVADA CREEK near Finn	APR-JUL	21.3	15.6	73	24.0	113	7.0	33
	APR-SEP	23.0	16.8	73	26.0	113	8.0	35
BLACKFOOT RIVER near Bonner	APR-JUL	904.0	750.0	83	1135.0	126	361.0	40
	APR-SEP	999.0	845.0	85	1275.0	128	415.0	42
	APR-JUN	782.0	645.0	82	981.0	125	309.0	40
CLARK FORK RIVER above Milltown 2	APR-JUL	708.0	600.0	85	856.0	121	345.0	49
	APR-SEP	816.0	695.0	85	989.0	121	401.0	49
	APR-JUN	597.0	510.0	85	725.0	121	295.0	49
CLARK FORK RIVER above Missoula	APR-JUL	1612.0	1350.0	84	2027.0	126	673.0	42
	APR-SEP	1815.0	1540.0	85	2302.0	127	778.0	43
	APR-JUN	1379.0	1155.0	84	1734.0	126	576.0	42

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVG.
GEORGETOWN LAKE	31.0	30.0	23.8	28.1
LOWER WILLOW CREEK	4.9	1.1	1.6	1.3
NEVADA CREEK		NO REPORT		

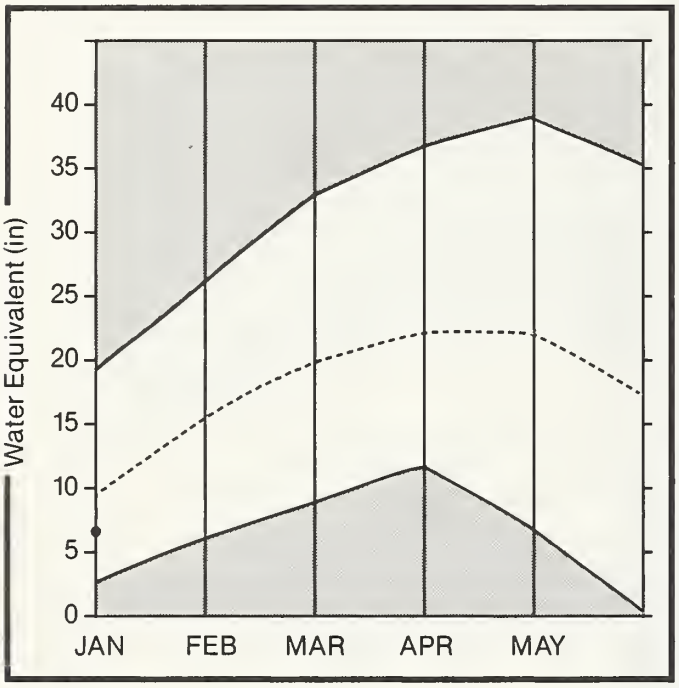
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
CLARK FORK ab BLACKFOOT	34	104	74
BLACKFOOT	17	102	79
CLARK FORK above MISSOULA	46	102	75

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Clark Fork Basin below Missoula

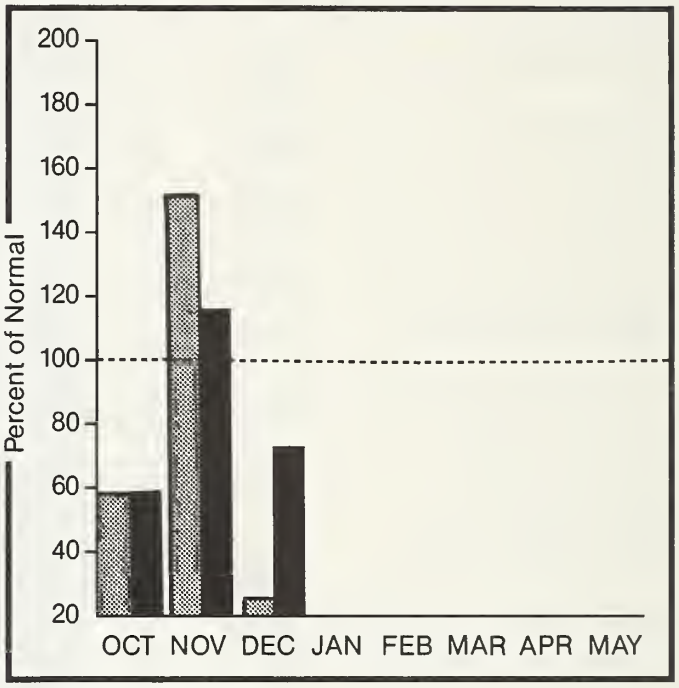
Mountain snowpack* (inches)



*Bitterroot

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Precipitation during December was very low with amounts recorded being only about 20 percent of average. Since October 1, mountain precipitation has totaled only about 75 percent of average. Current snowpacks are about 70 percent of average in the lower Clark Fork. Streamflows for spring and summer months are expected to be average on all drainages.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN below Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
CLARK FORK RIVER above Missoula	APR-JUL	1612.0	1350.0	84	2027.0	126	673.0	42
	APR-SEP	1815.0	1540.0	85	2302.0	127	778.0	43
	APR-JUN	1379.0	1155.0	84	1734.0	126	576.0	42
W.F. BITTERROOT RIVER nr Conner 2	APR-JUL	164.0	120.0	73	168.0	102	71.0	43
	APR-SEP	178.0	130.0	73	183.0	103	77.0	43
BITTERROOT RIVER near Darby	APR-JUL	532.0	445.0	84	603.0	113	285.0	54
	APR-SEP	580.0	480.0	83	654.0	113	306.0	53
	APR-JUN	464.0	390.0	84	529.0	114	251.0	54
SKALKAHO CREEK near Hamilton	APR-JUL	48.7	42.0	86	51.0	105	32.0	66
	APR-SEP	56.0	48.0	86	59.0	105	37.0	66
BURNT FORK CR nr Stevensville 2	APR-JUL	32.2	26.0	81	35.0	109	16.0	50
	APR-SEP	37.4	29.0	78	40.0	107	18.0	48
BITTERROOT RIVER at Missoula 2	APR-JUL	1384.0	1180.0	85	1789.0	129	571.0	41
	APR-SEP	1504.0	1270.0	84	1932.0	128	608.0	40
	APR-JUN	1191.0	1020.0	86	1544.0	130	496.0	42
CLARK FORK RIVER below Missoula	APR-JUL	2996.0	2530.0	84	3668.0	122	1392.0	46
	APR-SEP	3319.0	2810.0	85	4071.0	123	1549.0	47
	APR-JUN	2570.0	2180.0	85	3157.0	123	1203.0	47
CLARK FORK RIVER at St. Regis	APR-JUL	3928.0	3320.0	85	4734.0	121	1906.0	49
	APR-SEP	4411.0	3700.0	84	5288.0	120	2112.0	48
	APR-JUN	3428.0	2910.0	85	4144.0	121	1676.0	49
CLARK FORK RIVER near Plains 2	APR-JUL	11071.0	9660.0	87	12981.0	117	6339.0	57
	APR-SEP	12153.0	10580.0	87	14226.0	117	6934.0	57
	APR-JUN	9459.0	8230.0	87	11068.0	117	5392.0	57
THOMPSON RIVER near Thompson Falls	APR-JUL	233.0	184.0	79	249.0	107	119.0	51
	APR-SEP	261.0	210.0	80	283.0	108	137.0	52
PROSPECT CREEK at Thompson Falls	APR-JUL	132.0	114.0	86	154.0	117	74.0	56
	APR-SEP	142.0	123.0	87	166.0	117	80.0	56
CLARK FORK at Whitehorse Rapids 2	APR-JUL	12351.0	10600.0	86				
	APR-SEP	13575.0	11670.0	86				
	APR-JUN	10570.0	8990.0	85				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
PAINTED ROCKS LAKE		NO REPORT		
NOXON RAPIDS	335.0	313.2	301.1	316.8
COMO	34.9	6.6	11.8	9.2

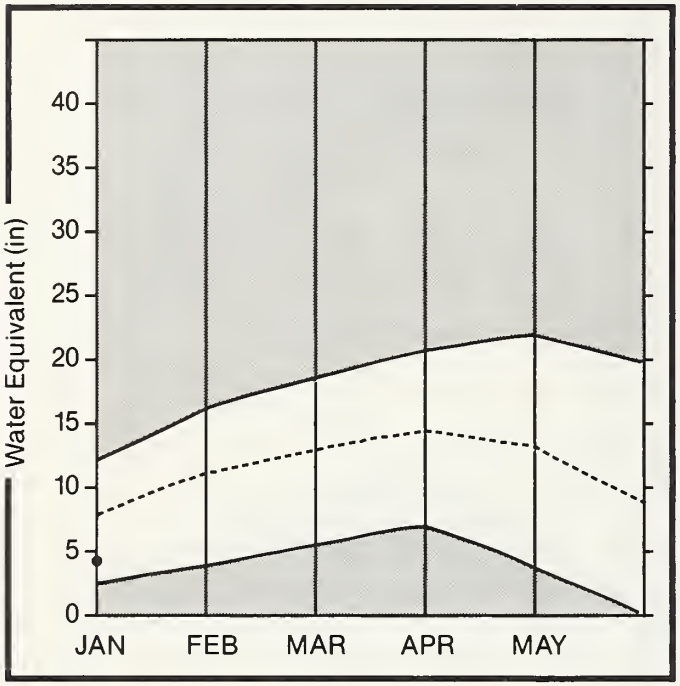
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
CLARK FORK above MISSOULA	46	102	75
BITTERROOT	19	108	67
LWR CLARK FK blw MISSOULA	15	119	83
BITTERROOT & LWR C.F.	32	114	75
CLARK FORK TOTAL	74	109	75
FLATHEAD	26	105	86
PEND O'REILLE	95	107	79

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Jefferson Basin

Mountain snowpack* (inches)



*Jefferson

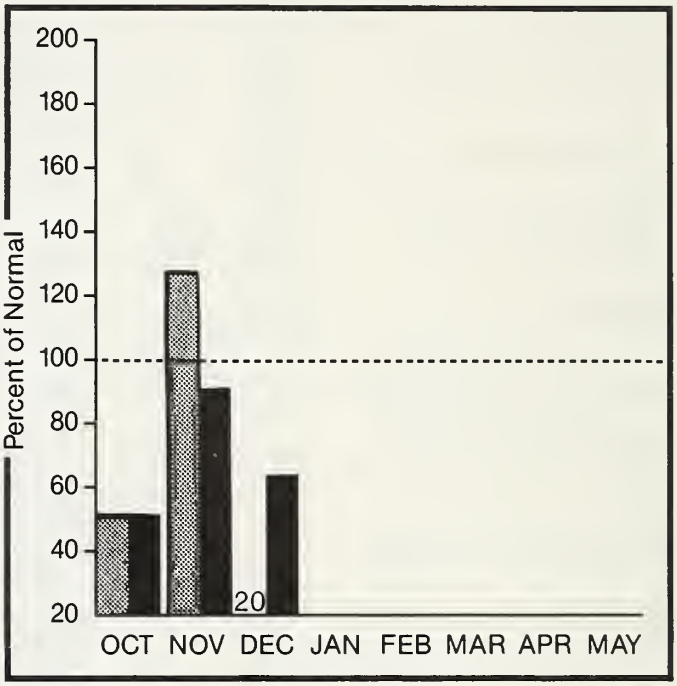
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack is only about 50 percent of average in the Red Rock drainage, increasing to about 80 percent of average in the northern part of the Jefferson tributaries. During December, mountain precipitation was only about 20 percent of average over the drainage. All drainages are forecast to have below average runoff this spring and summer. Conditions are a little better in the eastern and northern watersheds.

For more information contact your local Soil Conservation Service office.

JEFFERSON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
RED ROCK RIVER near Monida 2	APR-JUL	105.0	75.0	71	117.0	111	33.0	31
	APR-SEP	114.0	80.0	70	126.0	111	34.0	30
BEAVERHEAD RIVER near Grant 2	APR-JUL	149.0	113.0	76	132.0	89	53.0	36
	APR-SEP	174.0	125.0	72	195.0	112	55.0	32
BEAVERHEAD RIVER at Barratts 2	APR-JUL	192.0	148.0	77	225.0	117	71.0	37
	APR-SEP	224.0	170.0	76	260.0	116	80.0	36
RUBY RIVER near Alder	APR-JUL	89.0	83.0	93	115.0	129	51.0	57
	APR-SEP	106.0	98.0	92	136.0	128	60.0	57
BIG HOLE RIVER near Melrose	APR-JUL	696.0	565.0	81	803.0	115	328.0	47
	APR-SEP	757.0	610.0	81	867.0	115	353.0	47
WILLOW CREEK near Harrison	APR-JUL	18.7	17.3	93	28.0	150	10.0	53
	APR-SEP	21.0	19.1	91	28.0	133	11.0	52

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
LIMA	84.0	27.1	23.0	35.4
CLARK CANYON	255.6	161.0	129.5	142.2
RUBY RIVER	38.8	23.3	22.5	20.4

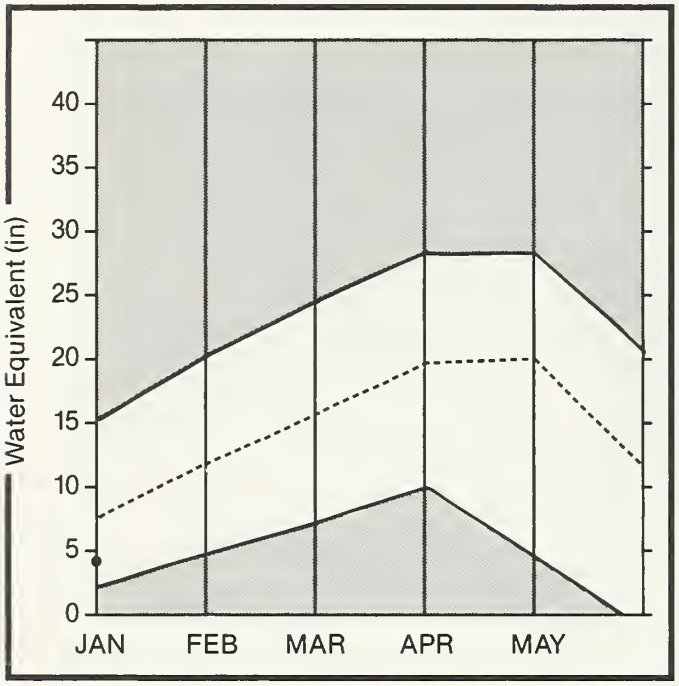
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
BEAVERHEAD	20	51	47
RUBY	4	78	73
BIGHOLE	19	109	69
BOULDER	12	90	80
JEFFERSON	46	73	60

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Madison Basin

Mountain snowpack* (inches)



*Madison

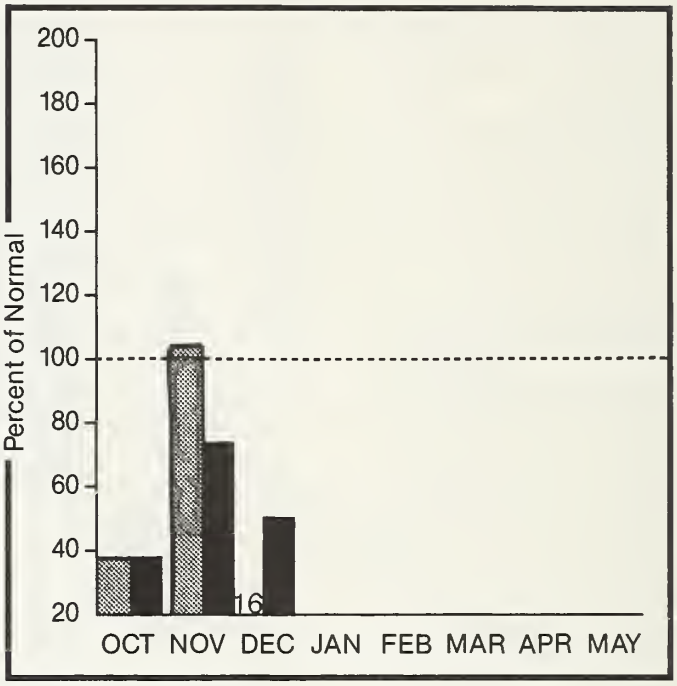
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack is well below average over the entire drainage. However, it is lower in the area above Hebgen Lake than it is in the Gravelly, Tobacco Root and Madison Ranges. Early season moisture was near average but dropped off to less than 20 percent of average in December. Runoff during spring and summer months is forecast to be below average in all drainages.

For more information contact your local Soil Conservation Service office.

MADISON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MADISON RIVER near Grayling 2	APR-JUL	390.0	360.0	92	437.0	112	282.0	72
	APR-SEP	499.0	460.0	92	560.0	112	360.0	72
MADISON RIVER near McAllister 2	APR-JUL	680.0	640.0	94	790.0	116	490.0	72
	APR-SEP	856.0	795.0	93	983.0	115	607.0	71

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
ENNIS LAKE	41.0	29.9	29.9	34.4
HEBGEN LAKE	377.5	282.1	277.3	239.6

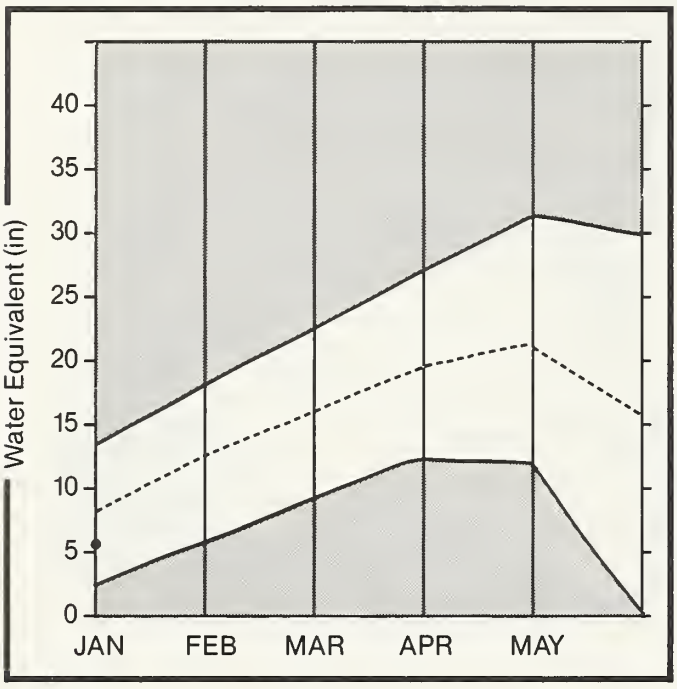
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
MADISON above HEBGEN	14	52	54
LOWER MADISON	8	77	69
MADISON	22	60	60

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Gallatin Basin

Mountain snowpack* (inches)



*Gallatin

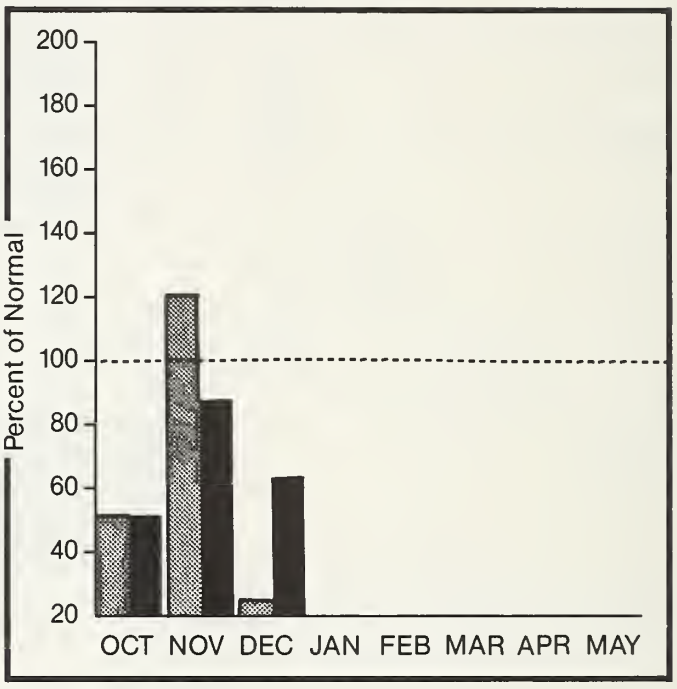
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Current snowpack is only about two-thirds of average throughout the drainage. November snowfall was above average but mountain precipitation was only about 25 percent of average in December. Based on current conditions, spring and summer streamflows are forecast to be below average from all drainages.

For more information contact your local Soil Conservation Service office.

GALLATIN RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
GALLATIN RIVER near Gateway	APR-JUL	460.0	420.0	91	525.0	114	319.0	69
	APR-SEP	540.0	490.0	91	609.0	113	371.0	69
E & W FK. HYALITE CR. nr Bozeman 2	APR-JUL	24.0	22.0	92	26.0	108	17.0	71
	APR-SEP	28.0	25.0	89	31.0	111	19.0	68
HYALITE CREEK near Bozeman 2	APR-JUL	38.0	35.0	92	44.0	116	26.0	68
	APR-SEP	44.0	40.0	91	51.0	116	29.0	66
GALLATIN RIVER at Logan	APR-JUL	528.0	455.0	86	613.0	116	297.0	56
	APR-SEP	616.0	530.0	86	715.0	116	345.0	56

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
MIDDLE CREEK	8.0	4.5	5.7	3.1

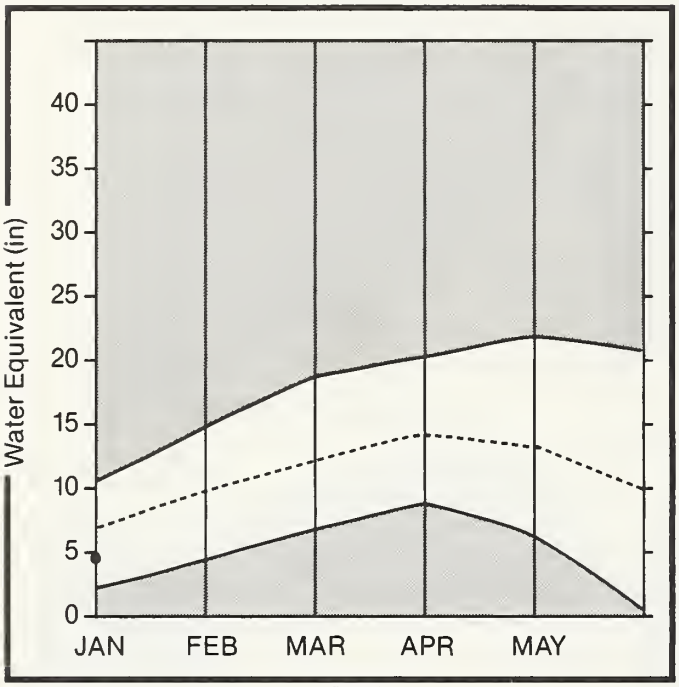
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
UPPER GALLATIN	8	82	67
EAST GALLATIN	11	115	68
GALLATIN	16	96	67

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Missouri Basin

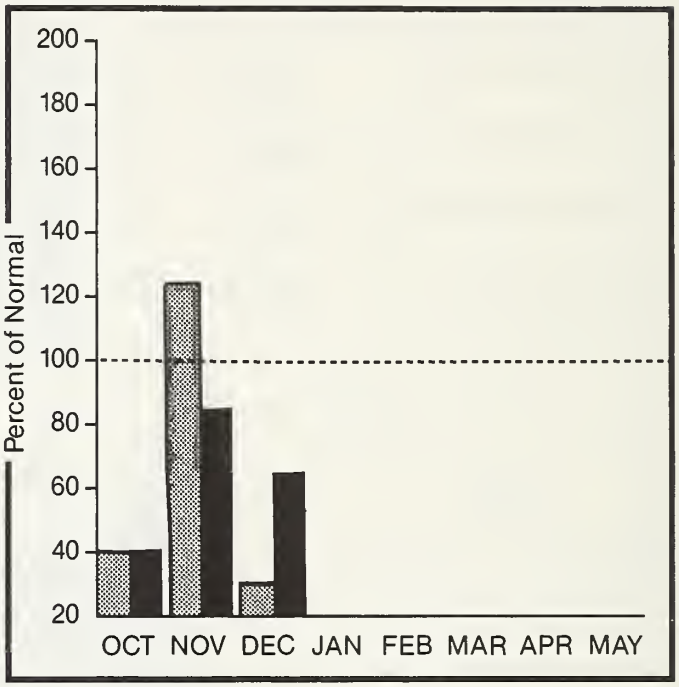
Mountain snowpack* (inches)



*Missouri Toston to Fort Peck

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack in the Missouri headwaters above Three Forks is about 60 percent of average. Mountains on the west side of the Missouri River have a little better snowpack while most other drainages have similar or somewhat poorer snow cover. During December, precipitation over the drainage was only about one-third of average. Spring and summer runoff is forecast to be below average in all drainages.

For more information contact your local Soil Conservation Service office.

MISSOURI RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MISSOURI RIVER at Toston 2	APR-JUL	2250.0	1970.0	88	2820.0	125	1230.0	55
	APR-SEP	2590.0	2110.0	81	3056.0	118	1295.0	50
SHEEP CREEK nr White Sulphur Spgs.	APR-JUL	18.8	15.6	83	24.0	128	7.0	37
	APR-SEP	22.0	18.0	82	28.0	127	8.0	36
BELT CREEK near Monarch	APR-JUL	123.0	91.0	74	140.0	114	42.0	34
	APR-SEP	134.0	99.0	74	153.0	114	45.0	34
MISSOURI RIVER at Fort Benton 2	APR-JUL	3470.0	2850.0	82	4400.0	127	1630.0	47
	APR-SEP	3990.0	3220.0	81	5067.0	127	1875.0	47
MISSOURI RIVER at Virgelle 2	APR-JUL	3960.0	3330.0	84	5550.0	140	1860.0	47
	APR-SEP	4500.0	3760.0	84	6300.0	140	2115.0	47
MISSOURI RIVER near Landusky 2	APR-JUL	4310.0	3660.0	85	6210.0	144	2070.0	48
	APR-SEP	4900.0	4160.0	85	7056.0	144	2352.0	48
N.F. MUSSELSHELL near Delpine	APR-JUL	5.6	4.0	71	6.0	107	2.0	36
	APR-SEP	6.4	4.7	73	8.0	125	2.0	31
S.F. MUSSELSHELL above Martinsdale	APR-JUL	57.0	44.0	77	69.0	121	19.0	33
	APR-SEP	61.0	45.0	74	72.0	118	18.0	30
MISSOURI RIVER below Fort Peck 2	APR-JUL	4260.0	3620.0	85	6260.0	147	1920.0	45
	APR-SEP	4800.0	4060.0	85	7056.0	147	2160.0	45

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CANYON FERRY LAKE	2043.0	1682.0	1556.0	1723.0
HELENA VALLEY	9.2	5.4	4.4	6.1
LAKE HELENA	10.4	10.9	10.9	10.3
HAUSER & HELENA	61.9	63.1	63.0	60.6
HOLTER LAKE	81.9	81.4	81.0	75.8
SMITH RIVER	10.6	6.9	3.5	6.4
NEWLAN CREEK	12.4	11.2	9.8	8.8
BAIR	7.0	6.4	0.5	3.8
MARTINSDALE	23.1	12.1	3.6	9.8
DEADMAN'S BASIN	72.2	50.6	26.4	42.7
FORT PECK LAKE *	18.9	16.2	14.1	15.4

*Million Acre Feet

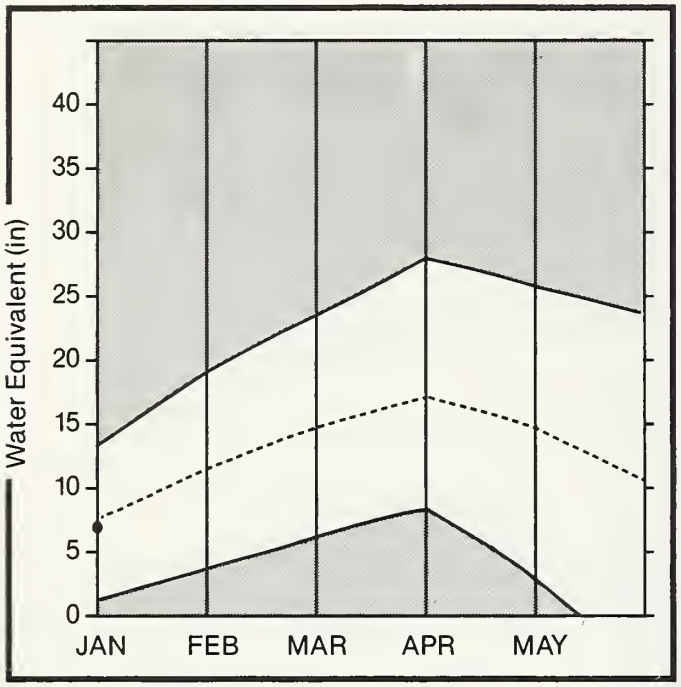
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
MISSOURI HEADWATERS	76	72	61
WEST SIDE MISSOURI	9	85	81
SMITH-BELT	7	58	61
MISSOURI MAINSTEM	16	69	70
SUN-TETON-MARIAS	12	108	99
JUDITH-MUSSELSHELL	11	59	53
MISSOURI above FORT PECK	102	77	66
MILK HEADWATERS	5	154	96
BEAR PAW	6	40	41
MILK RIVER	11	120	84
MISSOURI in MONTANA	110	77	66
MISSOURI blw YELLOWSTONE	160	78	72

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Sun, Teton and Marias Basins

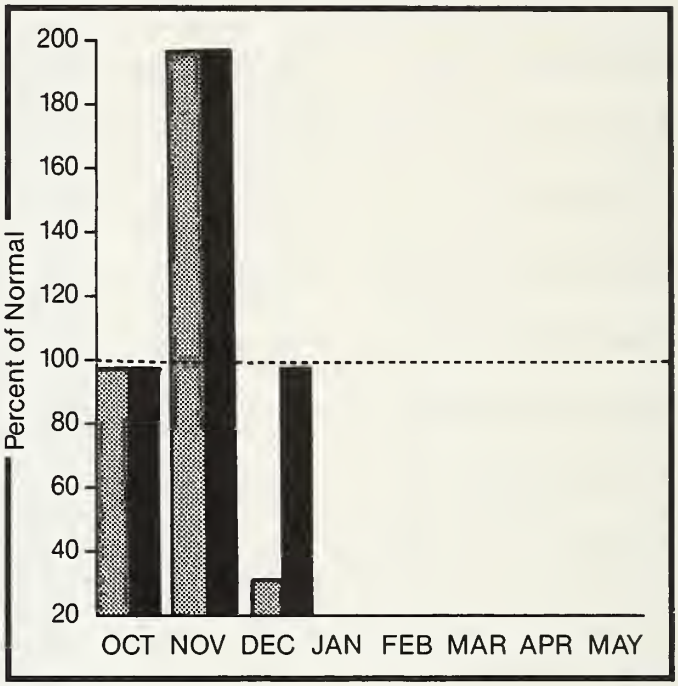
Mountain snowpack* (inches)



*Sun-Teton-Marias

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Even though December mountain precipitation was only about one-third of average, moisture earlier in the season was heavy enough to maintain current snowpack at near average levels in the main water producing zones. In the lower elevations, snow conditions are not quite as good. Spring and summer runoff is forecast to be near average.

For more information contact your local Soil Conservation Service office.

SUN-TETON-MARIAS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SUN RIVER at Gibson Dam 2	APR-JUL	494.0	455.0	92	593.0	120	317.0	64
	APR-SEP	542.0	495.0	91	647.0	119	343.0	63
TWO MEDICINE CREEK near Browning 2	APR-JUL	222.0	220.0	99	310.0	140	131.0	59
	APR-SEP	235.0	230.0	98	319.0	136	141.0	60
BADGER CREEK near Browning	APR-JUL	107.0	110.0	103	153.0	143	67.0	63
	APR-SEP	123.0	127.0	103	174.0	141	80.0	65
SWIFT RESERVOIR Inflow nr Dupuyer	APR-JUL	70.0	71.0	101	99.0	141	43.0	61
	APR-SEP	82.0	82.0	100	113.0	138	51.0	62
CUT BANK CREEK at Cut Bank	APR-JUL	92.0	90.0	98	137.0	149	53.0	58
	APR-SEP	100.0	98.0	98	136.0	136	60.0	60
MARIAS RIVER near Shelby	APR-JUL	478.0	455.0	95	637.0	133	273.0	57
	APR-SEP	501.0	480.0	96	670.0	134	290.0	58

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
GIBSON	99.1	46.2	71.0	39.6
PISHKUN	32.0	19.4	18.9	17.6
WILLOW CREEK	32.2	26.8	19.3	20.1
LOWER TWO MEDICINE LAKE	11.9	11.9	---	7.4
FOUR HORNS LAKE	19.2	13.6	---	12.2
SWIFT	30.0	15.9	18.9	12.2
LAKE FRANCES	112.0	83.8	63.1	68.6
LAKE ELWELL (TIBER)	1347.0	727.4	740.0	562.0

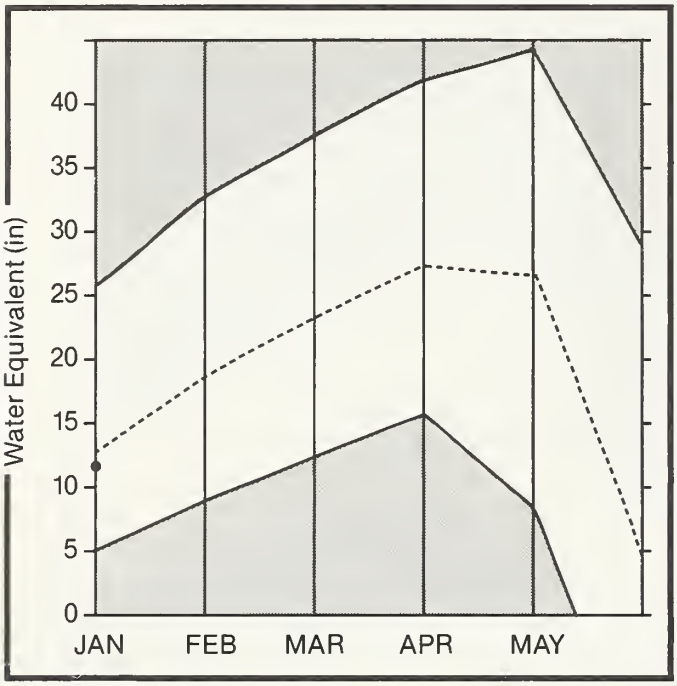
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
SUN-TETON	6	102	95
MARIAS	6	111	100
SUN-TETON-MARIAS	12	108	99

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

St. Mary and Milk Basins

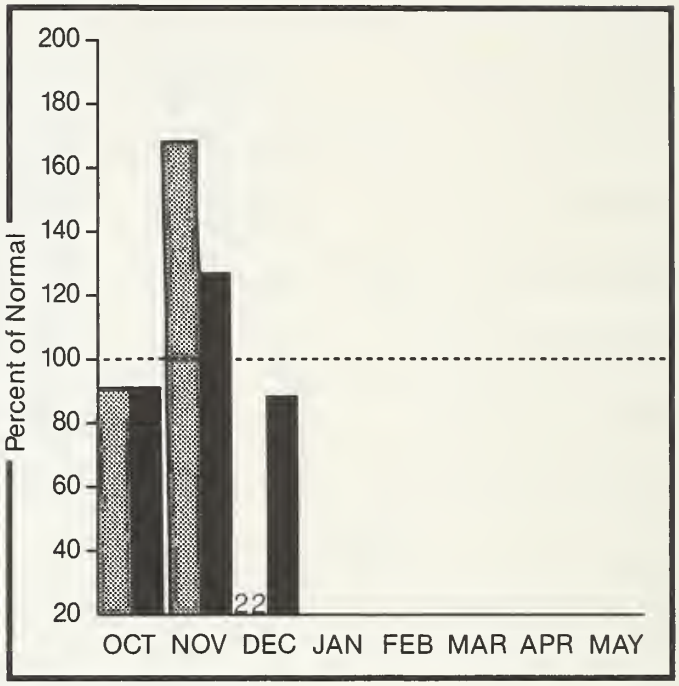
Mountain snowpack* (inches)



*St. Mary

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack in the St. Mary and Milk River headwaters is near average but less than one-half of average in the Bear Paw Mountains. Precipitation prior to December was above average but this past month has been quite dry. Spring and summer streamflows are forecast to be near average in the St. Mary and upper Milk tributaries decreasing to a little below average downstream.

For more information contact your local Soil Conservation Service office.

ST. MARY and MILK RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SWIFTCURRENT CREEK at Sherburne 2	APR-JUL	110.0	107.0	97	136.0	124	78.0	71
	APR-SEP	128.0	125.0	98	158.0	123	92.0	72
ST. MARY RIVER near Babb 2	APR-JUL	404.0	390.0	97	426.0	105	309.0	76
	APR-SEP	474.0	450.0	95	545.0	115	355.0	75
MILK RIVER at Eastern Crossing	MAR-SEP	270.0	276.0	102				
MILK RIVER at Eastern Crossing 2	MAR-SEP	97.0	93.0	96	171.0	176	62.0	64

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
LAKE SHERBURNE	64.3	38.0	32.2	18.8
FRESNO	127.0	63.2	39.9	53.5
BEAVER CREEK	3.5	2.3	2.8	1.8
NELSON	66.8	47.9	30.3	38.9

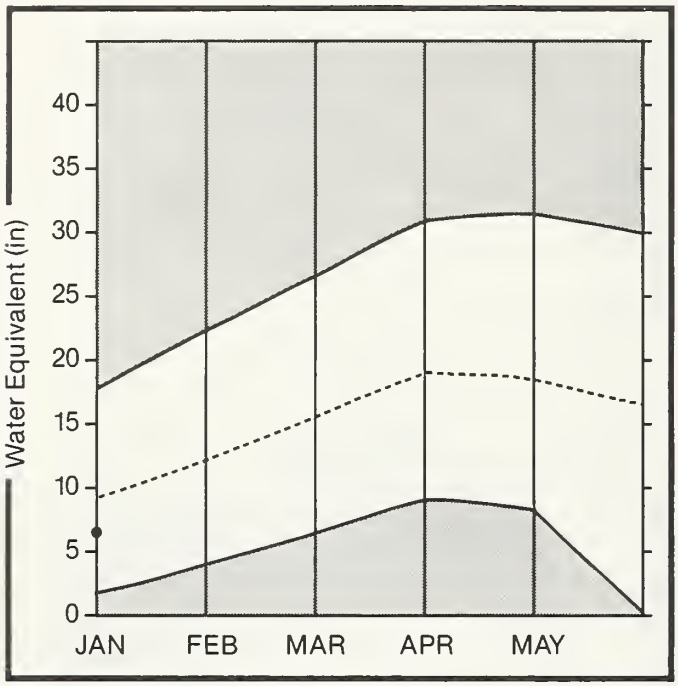
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
MILK HEADWATERS	5	154	96
BEAR PAW	6	40	41
MILK RIVER	11	120	84
ST. MARY	6	140	96
ST. MARY and MILK	12	119	88
BOW RIVER in ALBERTA	0	0	0
OLDMAN RIVER in ALBERTA	0	0	0

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Yellowstone Basin

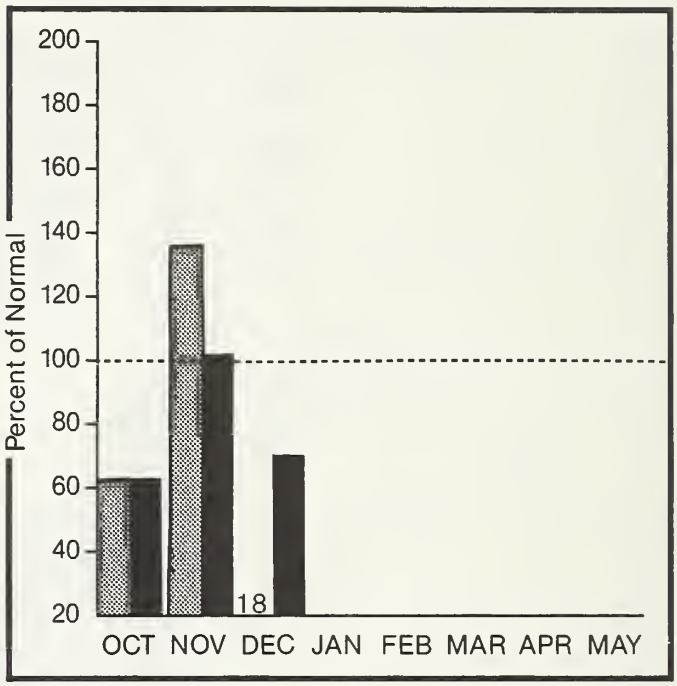
Mountain snowpack* (inches)



*Yellowstone above Big Horn

Maximum
Average
Minimum
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack is near average on the northeast face of the Beartooth Mountains but below average elsewhere. During December, mountain precipitation was only about 20 percent of average over the basin. Streamflow for the spring and summer period is forecast below average on most tributaries. However, the Stillwater, Boulder and Clark's Fork Rivers are somewhat higher than the Yellowstone headwaters and Shields River.

For more information contact your local Soil Conservation Service office.

YELLOWSTONE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
YELLOWSTONE at Lake Outlet	APR-SEP	818.0	675.0	83	897.0	110	528.0	65
YELLOWSTONE at Corwin Springs	APR-JUL	1650.0	1385.0	84	1715.0	104	1055.0	64
	APR-SEP	2000.0	1660.0	83	2060.0	103	1260.0	63
YELLOWSTONE near Livingston	APR-JUL	1920.0	1600.0	83	1984.0	103	1216.0	63
	APR-SEP	2330.0	1930.0	83	2396.0	103	1464.0	63
BOULDER RIVER at Big Timber	APR-JUL	353.0	328.0	93	427.0	121	229.0	65
	APR-SEP	384.0	348.0	91	456.0	119	240.0	63
STILLWATER RIVER nr Absarokee 2	APR-JUL	524.0	507.0	97	698.0	133	318.0	61
	APR-SEP	625.0	605.0	97	830.0	133	380.0	61
CLARKS FORK RIVER near Belfry	APR-JUL	540.0	515.0	95	702.0	130	331.0	61
	APR-SEP	603.0	580.0	96	785.0	130	375.0	62
COONEY RESERVOIR Inflow	APR-JUL	49.0	48.0	98	66.0	135	30.0	61
	APR-SEP	60.0	58.0	97	80.0	133	36.0	60
YELLOWSTONE RIVER at Billings	APR-JUL	3740.0	3330.0	89	4260.0	114	2470.0	66
	APR-SEP	4410.0	3980.0	90	5027.0	114	2911.0	66
BIGHORN RIVER near St. Xavier 2	APR-JUL	1750.0	1840.0	105				
	APR-SEP	1900.0	2000.0	105				
LITTLE BIGHORN RIVER near Hardin	APR-JUL	148.0	145.0	98				
	APR-SEP	167.0	159.0	95	250.0	150	22.0	13
TONGUE RIVER near Decker	APR-JUL	234.0	225.0	96				
	APR-SEP	260.0	247.0	95				
YELLOWSTONE RIVER at Miles City 2	APR-JUL	5640.0	5420.0	96				
	APR-SEP	6510.0	6250.0	96	8463.0	130	4036.0	62
POWDER RIVER at Moorehead	APR-JUL	230.0	210.0	91				
	APR-SEP	251.0	226.0	90				
YELLOWSTONE RIVER near Sidney 2	APR-JUL	6260.0	5950.0	95				
	APR-SEP	7200.0	6830.0	95				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
MYSTIC LAKE	21.0	7.8	4.5	12.5
COONEY	27.4	15.0	15.4	13.3
BIGHORN LAKE	1356.0	871.0	768.8	874.0
TONGUE RIVER		NO REPORT		

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
YELLOWSTONE ab LIVINGSTON	17	77	72
SHIELDS	7	115	64
BOULDER-STILLWATER	3	87	93
CLARK'S FORK-ROCK CREEK	15	80	76
YELLOWSTONE above BIGHORN	31	84	72
LITTLE BIGHORN	2	62	77
WIND RIVER (Wyoming)	13	85	115
BIGHORN RIVER (Wyoming)	21	78	86
BIGHORN BASIN (Total)	30	81	93
TONGUE RIVER (Wyoming)	6	71	85
POWDER RIVER (Wyoming)	7	58	60
YELLOWSTONE RIVER	63	82	81

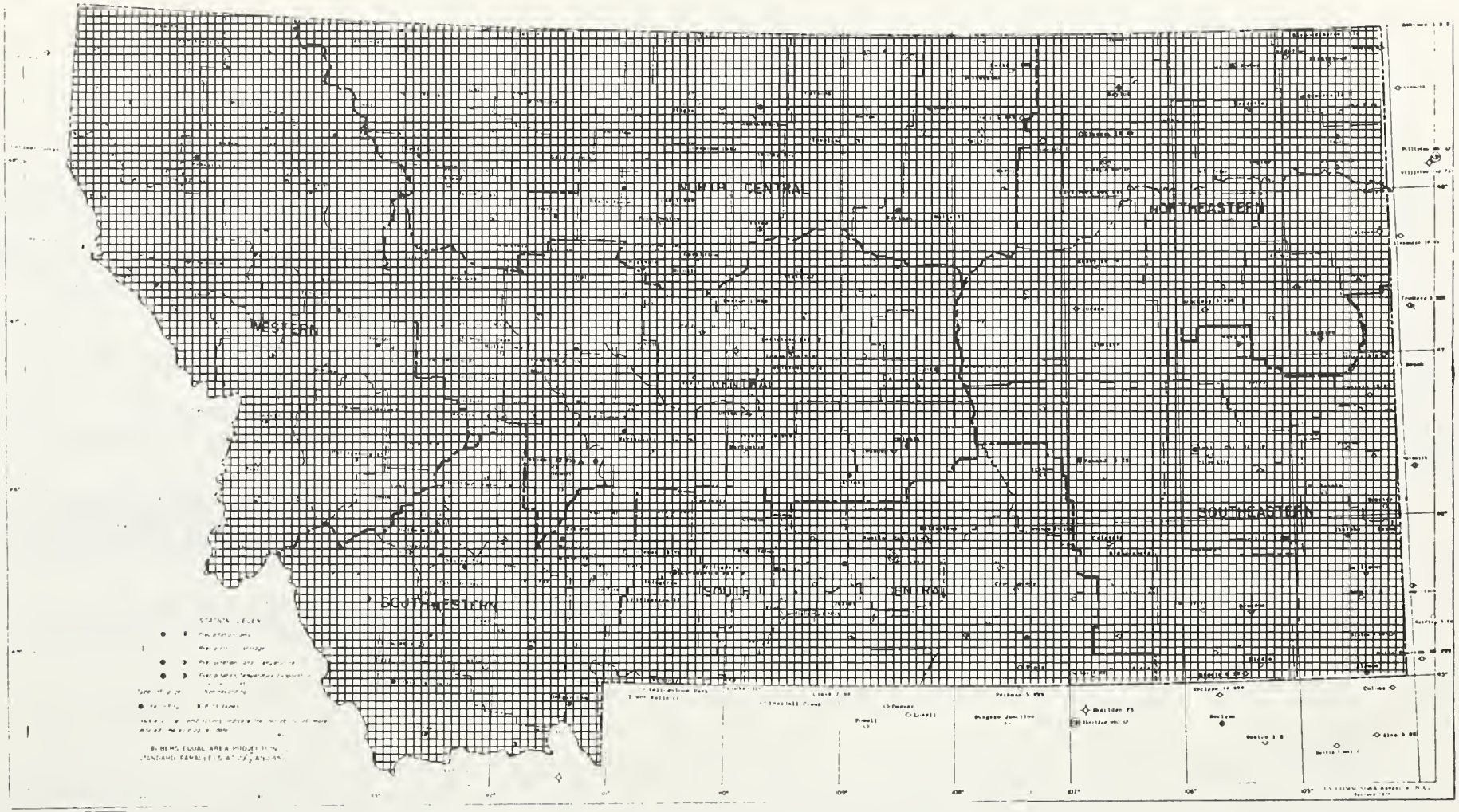
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Snow Data Measurements

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
MONTANA						
ARCH FALLS	7350	12/29/86	13	3.0	2.5	5.3
BADGER PASS PILLOW	6900	1/01/87	---	14.5	15.6	15.5
BADGER PASS	6900	12/31/86	62	20.5	20.5	20.0
BARKER LAKES	8250	12/31/86	20	5.4	5.2	7.5
BARKER LAKES PILLOW	8250	1/01/87	---	6.4	5.3	7.7
BASIN CREEK	7180	12/29/86	14	2.9	2.9	4.3
BASIN CREEK PILLOW	7180	1/01/87	---	2.6	1.7	3.7
BEAGLE SPGS PILLOW	8850	1/01/87	---	3.0	3.8	3.7
BEAR PAW SKI AREA	5200	12/29/86	7	1.4	3.0	2.7
BEAVER CREEK PILLOW	7850	1/01/87	---	5.0	7.1	8.7
BLACK BEAR	7950	12/29/86	32	8.4	18.2	17.6
BLACK BEAR PILLOW	7950	1/01/87	---	10.4	17.0	16.8
BLACK PINE PILLOW	7100	1/01/87	---	3.9	3.1	5.8
BLACK PINE	7100	12/24/86	15	2.8	2.6	4.9
BLOODY DICK PILLOW	7550	1/01/87	---	4.1	4.4	6.3
BLOODY DICK	7600	12/30/86	16	3.2	--	6.8
BLUE LAKE	5900	12/31/86	32	10.0	11.0	10.8
BOULDER MTN PILLOW	7950	1/01/87	---	7.2	8.8	10.0
BOX CANYON PILLOW	6700	1/01/87	---	4.1	5.2	4.3
BOXELDER CREEK	5100	12/29/86	12	3.2	3.0	4.6
BRIDGER BOWL PILLOW	7250	12/31/86	---	7.2	4.9	11.3
BRIDGER BOWL	7250	12/31/86	23	7.2	4.8	11.2
CALVERT CREEK	6430	12/29/86	15	2.9	2.0	5.5
CALVERT CR PILLOW	6430	1/01/87	---	2.4	1.8	4.6
CARROT BASIN PILLOW	9000	1/01/87	---	9.5	11.6	12.8
CARROT BASIN	9000	12/30/86	40	10.3	13.8	16.1
CASHE CREEK PILLOW	7800	1/01/87	---	3.3	3.9	4.2
CHESSMAN RESERVOIR	6200	12/29/86	8	2.2	1.8	1.5
CLOVER MDW PILLOW	8800	1/01/87	---	7.2	7.6	8.2
COLE CREEK	7850	12/30/86	30	8.7	9.2	8.5
COLE CREEK PILLOW	7850	1/01/87	---	9.0	8.8	7.8
COMBINATION	5600	12/24/86	9	1.8	1.7	2.2
COMBINATION PILLOW	5600	1/01/87	---	1.8	1.8	2.6
COPPER BOTTOM PILLOW	5200	1/01/87	---	4.4	4.1	6.3
COPPER CAMP PILLOW	6950	1/01/87	---	9.8	10.4	16.2
COYOTE HILL	4200	12/30/86	18	3.2	3.0	4.3
CRYSTAL LAKE PILLOW	6050	1/01/87	---	3.0	5.5	6.5
DAISY PEAK	7600	12/30/86	15	2.8	3.8	5.8
DALY CREEK	5780	12/27/86	17	3.3	--	5.0
DARKHORSE LK. PILLOW	8700	1/01/87	---	9.7	8.3	12.3
DEADMAN CR PILLOW	6450	1/01/87	---	2.8	4.1	4.8
DEADMAN CREEK	6450	12/30/86	16	3.0	4.6	5.1
DEVILS SLIDE	8100	12/29/86	24	7.2	7.2	10.0
DISCOVERY BASIN	7050	12/30/86	17	3.3	2.9	4.8
DIVIDE PILLOW	7800	1/01/87	---	2.1	4.3	4.8
DIX HILL	6400	12/28/86	16	3.9	3.9	5.4
DUPUYER CREEK PILLOW	5750	1/01/87	---	4.5	4.2	5.1
EMERY CREEK PILLOW	4350	1/01/87	---	5.9	4.6	7.9
FISH CREEK	8000	12/29/86	17	5.8	3.6	4.5
FISHER CREEK PILLOW	9100	1/01/87	---	11.3	14.4	16.2
FLATTOP MTN PILLOW	6300	1/01/87	---	20.9	18.0	21.3
FROHNER MEADOWS	6480	12/30/86	13	3.1	2.2	3.9
FROHNER MDWS PILLOW	6480	1/01/87	---	3.2	3.7	4.2
GARVER CREEK	4250	12/29/86	18	4.3	--	5.6
GIBBONS PASS	7100	12/30/86	23	5.2	6.0	9.7
GRAVE CRK PILLOW	4300	1/01/87	---	7.1	3.3	8.7
GRAVE CREEK	4300	12/30/86	30	7.6	--	8.2
HAND CREEK	5030	12/30/86	17	3.4	5.0	5.9
HAND CREEK PILLOW	5030	1/01/87	---	3.7	3.6	6.4
HEART LAKE TRAIL	4800	12/28/86	27	6.7	6.9	9.2
HEBGEN DAM	6550	12/30/86	14	2.0	4.8	5.0
HELL ROARING DIVIDE	5770	12/29/86	32	9.1	10.2	13.6
HOLBROOK	4530	12/31/86	13	3.0	4.5	4.0
HOOD MEADOW	6600	12/29/86	12	2.4	2.4	4.9
HOODOO BASIN PILLOW	6050	1/01/87	---	15.1	13.8	20.3
HOODOO BASIN	6050	12/28/86	56	17.8	16.7	21.5
HOODOO CREEK	5900	12/28/86	48	14.6	12.6	19.1
JOHNSON PARK	6450	12/29/86	11	2.1	2.8	3.7
KINGS HILL	7500	12/30/86	15	3.2	8.0	6.6
KIWANIS CAMP	3720	12/29/86	0	.0	1.8	1.1
KRAFT CREEK PILLOW	4750	1/01/87	---	5.3	4.1	5.7
LAKEVIEW CANYON	6930	12/29/86	9	1.0	3.9	5.4
LAKEVIEW RDG. PILLOW	7400	1/01/87	---	1.7	5.5	6.4
LAKEVIEW RIDGE	7400	12/29/86	8	.8	4.0	4.8
LEMHI RIDGE	8100	12/30/86	17	3.6	3.5	4.5
LEMHI RIDGE PILLOW	8100	1/01/87	---	3.5	4.2	4.9
LICK CREEK PILLOW	6860	1/01/87	---	2.9	3.6	4.1
LICK CREEK	6860	12/29/86	16	3.4	2.4	4.2

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
LOST HORSE	5940	12/29/86	30	8.7	7.4	13.2
LOWER TWIN PILLOW	7900	1/01/87	---	8.9	9.2	10.1
LUBRECHT FLUME	4680	12/31/86	10	2.5	1.5	2.7
LUBRECHT PILLOW	4680	1/01/87	---	2.5	2.4	2.5
LUBRECHT FOREST NO 3	5450	12/30/86	12	2.3	2.0	2.7
LUBRECHT FOREST NO 4	4650	12/30/86	6	1.0	1.2	1.5
LUBRECHT FOREST NO 6	4040	12/30/86	7	1.7	1.2	1.7
LUBRECHT HYDROPLOT	4200	12/31/86	14	2.6	1.2	3.2
MADISON PLT PILLOW	7750	12/29/86	---	6.1	10.4	10.6
MADISON PLATEAU	7750	12/29/86	22	5.0	10.6	9.3
MANY GLACIER	4900	12/31/86	30	7.8	4.8	9.6
MANY GLACIER PILLOW	4900	1/01/87	---	7.4	3.7	9.4
MARIAS PASS	5250	1/01/87	26	7.3	4.7	7.1
MAYNARD CREEK	6210	12/31/86	18	4.8	3.0	6.1
MAYNARD CR PILLOW	6210	12/31/86	---	3.5	2.6	5.2
MONUMENT PK PILLOW	8850	1/01/87	---	6.6	10.1	9.6
MOSS PEAK PILLOW	6780	1/01/87	---	14.6	13.4	17.9
MOULTON RESERVOIR	6850	12/29/86	13	2.1	1.0	2.3
MT LOCKHART PILLOW	6400	1/01/87	---	9.2	10.1	9.2
MOUNT LOCKHART	6400	12/29/86	31	8.6	9.6	8.8
MULE CREEK PILLOW	8300	1/01/87	---	6.1	4.1	5.7
NEVADA CREEK PILLOW	6480	1/01/87	---	4.4	4.0	5.2
NEZ PERCE CMP PILLOW	5650	1/01/87	---	4.4	3.4	6.7
NEZ PERCE CAMP	5650	12/30/86	19	3.8	3.6	6.5
NEZ PERCE PASS	6570	12/30/86	18	4.0	--	7.1
NOISY BASIN PILLOW	6040	1/01/87	---	12.2	14.5	17.4
N.F. ELK CR PILLOW	6250	1/01/87	---	4.8	3.7	5.0
N.F. ELK CREEK	6250	12/31/86	16	4.0	3.6	5.3
N.E. ENTRANCE PILLOW	7350	1/01/87	---	2.5	3.7	4.1
NORTHEAST ENTRANCE	7350	1/01/87	10	2.6	2.7	3.8
OPHIR PARK	7150	12/28/86	22	6.2	5.7	7.3
PETERSON MDW PILLOW	7200	1/01/87	---	3.6	2.6	4.8
PETERSON MEADOWS	7200	12/29/86	15	3.6	2.8	4.6
PICKFOOT CRK PILLOW	6650	1/01/87	---	5.6	4.8	4.5
PIKE CREEK	5930	12/29/86	35	12.4	8.2	11.0
PIKE CREEK PILLOW	5930	1/01/87	---	12.3	9.2	12.3
PIPESTONE PASS	7200	12/29/86	10	2.2	2.0	2.2
PLACER BASIN PILLOW	8830	1/01/87	---	9.6	8.0	8.0
POORMAN CREEK	5100	12/29/86	43	13.8	--	15.5
PORCUPINE PILLOW	6500	1/01/87	---	1.8	2.2	3.3
PORCUPINE	6500	12/29/86	6	1.8	--	3.4
ROCKER PEAK	8000	12/26/86	17	4.2	6.1	6.6
ROCKER PEAK PILLOW	8000	1/01/87	---	5.1	6.9	6.6
ROCKY BOY	4700	12/29/86	5	.7	2.0	1.7
ROCKY BOY PILLOW	4700	12/29/86	---	1.7	--	2.5
SADDLE MTN PILLOW	7900	1/01/87	---	6.8	7.8	12.0
SADDLE MOUNTAIN	7940	12/30/86	26	6.3	7.5	11.0
SHOWER FALLS	8100	12/29/86	25	7.6	7.8	10.9
SHOWER FALLS PILLOW	8100	1/01/87	---	8.3	8.8	11.0
SILVER RUN	6630	12/30/86	7	1.8	1.5	2.2
SILVER RUN PILLOW	6630	1/01/87	---	2.2	2.2	2.2
SKALKAHO PILLOW	7260	1/01/87	---	7.6	6.3	11.4
SKALKAHO SUMMIT	7250	12/27/86	27	7.0	6.2	11.4
SKYLARK TRAIL PILLOW	6200	1/01/87	---	11.2	8.4	12.5
S.F. SHIELDS PILLOW	8100	1/01/87	---	5.3	6.6	8.3
S.F. SHIELDS	8100	12/29/86	24	7.0	8.0	11.7
SPUR PARK PILLOW	8100	1/01/87	---	5.2	12.1	10.6
SPUR PARK	8100	12/30/86	19	4.2	11.3	9.5
STAHL PEAK PILLOW	6030	1/01/87	---	20.5	12.5	19.1
STORM LAKE	7780	12/29/86	17	4.4	3.6	5.7
SUCKER CREEK	3960	12/29/86	0	.0	.8	.6
TAYLOR ROAD	4080	12/29/86	0	.0	2.7	2.2
TEN MILE LOWER	6600	12/29/86	11	2.8	3.1	3.1
TEN MILE MIDDLE	6800	12/29/86	17	4.3	6.0	4.8
TEN MILE UPPER	8000	12/29/86	17	4.6	6.2	5.8
TEPEE CREEK PILLOW	8000	1/01/87	---	3.4	6.6	6.5
TWELVEMILE PILLOW	5600	1/01/87	---	5.2	4.3	7.4
TWELVEMILE CREEK	5600	12/29/86	23	6.0	5.9	8.4
TWENTY-ONE MILE	7150	12/30/86	16	3.5	6.8	7.7
TWIN CREEKS	3580	12/29/86	19	4.5	6.0	5.4
TWIN LAKES PILLOW	6400	1/01/87	---	12.0	10.6	17.7
TWIN LAKES	6510	12/29/86	38	12.0	10.1	17.1
WALDRON PILLOW	5600	1/01/87	---	4.7	3.2	4.8
WALDRON	5600	12/29/86	16	3.8	2.8	4.1
WARM SPRINGS	7800	12/30/86	22	5.6	6.4	11.3
WARM SPRINGS PILLOW	7800	1/01/87	---	7.0	9.1	12.5
WEASEL DIVIDE	5450	12/30/86	51	15.0	--	17.5
WEST YELL'ST PILLOW	6700	12/30/86	---	1.7	4.9	4.3
WEST YELLOWSTONE	6700	12/30/86	11	2.0	5.5	5.1
WHISKEY CREEK PILLOW	6800	1/01/87	---	4.2	8.7	7.6
WHISKEY CREEK	6800	12/29/86	18	4.3	10.2	7.7
WHITE MILL PILLOW	8700	1/01/87	---	7.4	10.5	11.9
WILLOW CREEK	6500	12/30/86	14	2.8	3.7	3.7
WOOD CREEK PILLOW	5960	1/01/87	---	3.3	3.5	4.0

Valley Precipitation



Over 130%

110 - 130%

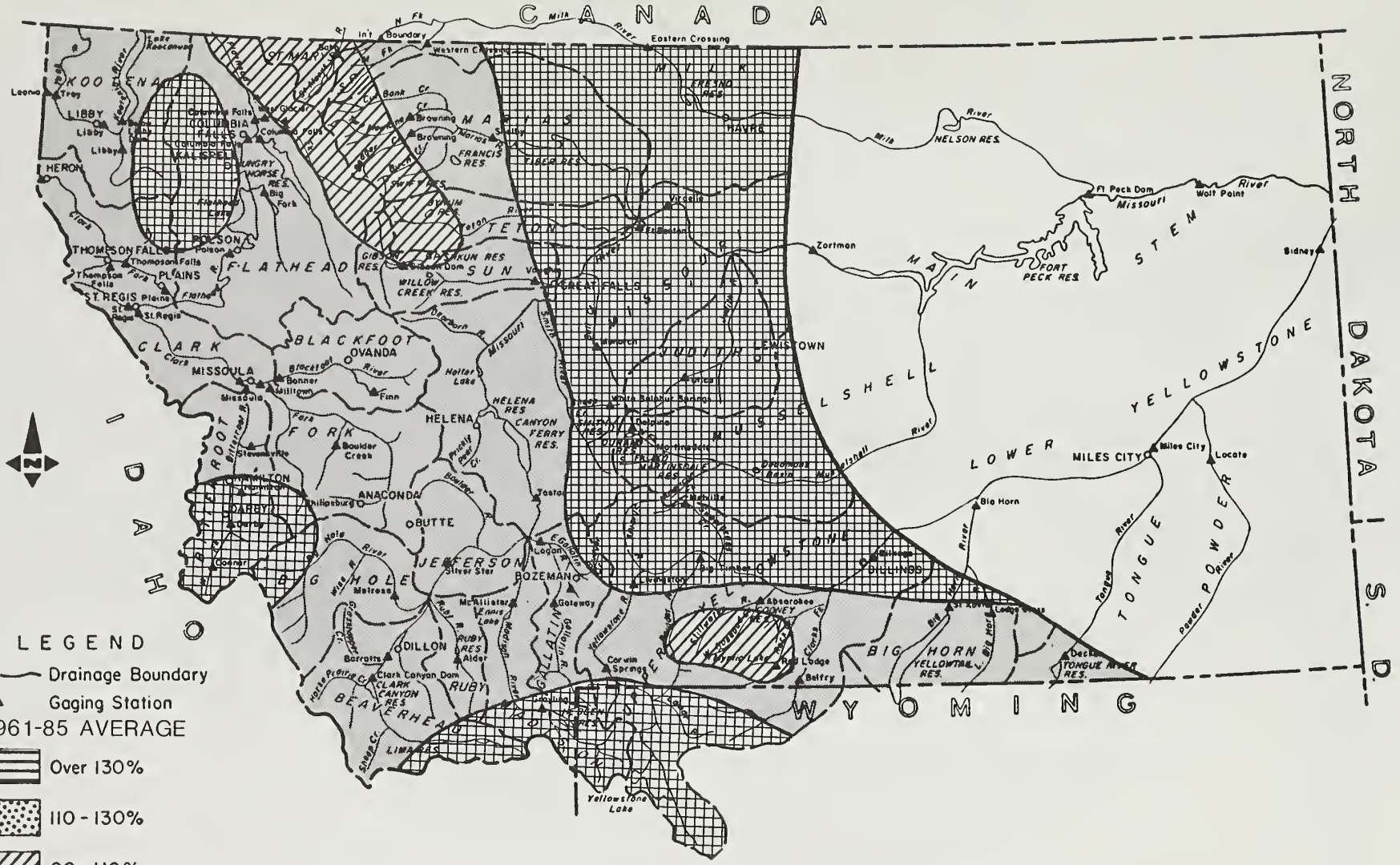
90 - 110%

70 - 90%

Under 70%

DECEMBER 1986

Source: NWS
Great Falls, MT



MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

JANUARY 1, 1987

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canadian

Department of the Environment
- Atmospheric Environment Service
- Water Management Service

British Columbia Ministry of Environment
- Inventory and Engineering Branch, Hydrology Section

Alberta Environment
- Technical Services Division

Federal

U.S. Department of Agriculture
- Forest Service

U.S. Department of the Army
- Corps of Engineers

U.S. Department of Commerce
- NOAA, National Weather Service
- National Environmental Satellite Service

U.S. Department of the Interior
- Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation

U.S. Department of Energy
- Bonneville Power Administration

State

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

Private

Big Sky of Montana
Butte Water Company
Confererated Salish & Kootenai Tribes
Flathead Valley Comminity College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports.
Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock Street
Bozeman, MT 59715

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS

PERMIT NO G-267

THIRD CLASS MAIL

Montana
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE